

ELECTROMAGNETIC POWER AND COMMUNICATION LINK PARTICULARLY  
ADAPTED FOR DRILL COLLAR MOUNTED SENSOR SYSTEMS

ABSTRACT

[0034] An electromagnetic coupling system is disclosed which includes a first electromagnetic transducer sealingly disposed in an outer wall of a tool mandrel, the mandrel adapted to be positioned in a drill collar. A second electromagnetic transducer is sealingly disposed in an interior of a port in the drill collar. The second transducer is positioned so that it is proximate the first transducer when the mandrel is positioned in the drill collar. A third electromagnetic transducer is sealingly disposed in an exterior of the port in the collar. The second and third transducers define a sealed chamber in the port. The second and third transducers are electrically coupled to power conditioning and signal processing circuits disposed in the chamber. A fourth transducer is positioned proximate the third transducer. The fourth transducer is electrically coupled to at least one of a sensor, an external communication line and an external power line.